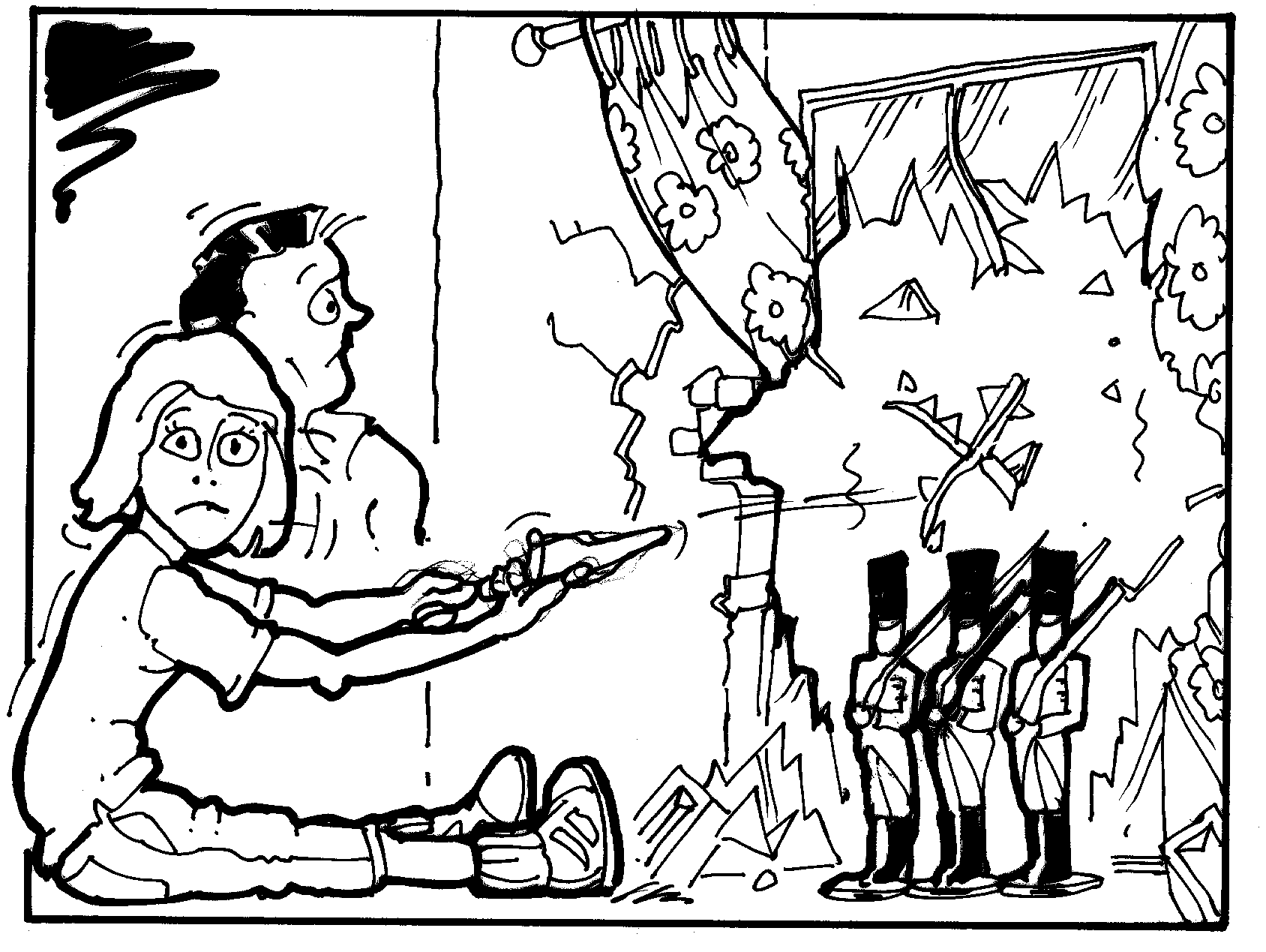
**A5: Pellet Game**



**You are working for the WA Games Company on a new type of game for children. In the game, pellets are fired at toy soldiers on the floor. The mechanism involves a rubber band to propel the pellets.**

**Your task is to investigate the way the firing system works and to find out how far it can fire (the range).**

**You will report back to the WA Games Company Board.**

***Discuss the problem.***

**Variables**

What is a variable?

The most important variables in the system which are likely to affect the range of the pellet are:

***Choose ONE of the variables above to be the focus of your investigation.***

The variable affecting the range chosen to investigate is:

It is predicted that this variable will affect range in the following way:

***Plan the Investigation.***

The independent variable (what is changed) is going to be:

The dependent variable (what is affected because of what is changed) is going to be:

The other variables which must be kept constant are:

This is what will be varied:

These are the measurements to be taken:

Here are the details of how the measurements will be taken:

This labelled diagram helps to explain these measurements:

Here are some techniques which might help get more accuracy in the measurements:

Here is what each person will do:

***Make a prediction.(Hypothesis)***

It is predicted that the relationship between the variables will look like this graph:

|  |  |
| --- | --- |
|  |  |

***Now do some trials in a preliminary experiment***

**Method**

Below, in point form, is exactly what is planned to do for the experimental design.

***Check with the teacher*** OK to go ahead Think again and discuss

***Now perform the experiment carefully and accurately. There will need to be at least three measurements for each change made. It can be useful to put the results in a table.***

**Results (**a table might be useful!)

Here are some of the techniques used to reduce errors in the experiment and to increase accuracy:

Here are some interesting things noticed during the experiment:

Display these results using a: LINE GRAPH

***Make some conclusions about what the graph shows.***

The pattern shown by the results is:

How well do these conclusions fit with the prediction?

**If this investigation was to be repeated . . . . . . .**

How could the fairness and/or accuracy of this investigation be improved?

How could the equipment or procedure be improved?

What else could be done differently next time?

How could this investigation be extended if it was to be continued?

Applications of science

Elastic bands are very good “storers of energy”.

Brainstorm different ways in which the energy stored in an elastic band could be or has been used in some other interesting children’s games.

**Communication of the product.**

This contract requires a report of the evidence for the way the range of the pellet changes with the chosen variable. A word processed report including graphics is to be handed to the CEO. Be sure to explain all the findings and graphs.